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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/705,166	11/01/2000	Zhimin Liu	13854-001001	4721

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EXAMINER

KIANNI, KAVEH C

ART UNIT	PAPER NUMBER
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2877

DATE MAILED: 09/23/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/705,166

Applicant(s)

LIU, ZHIMIN

Examiner

Kevin C Kianni

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected. 1-8 and 11-20
- 7) ☐ Claim(s) 9-10 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to because certain/essential numbered elements of the drawings in figures 1-3 are not labeled. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claims

2. The expression 'March-Zanter' (at least in claim 6) is misspelled. Also the numbering of the claims (17-21) is incorrect. Corrections are required.

Reason for Allowance

3. Claims 9-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The reason for the allowability of claims 9-10 is that the prior art, in combination with the other limitations of the base claim, does not teach wherein a reflective means for reflecting a portion of said collimated beams as second group of parallel beams transmitted along a second optical path away from said collimated parallel beams; a third collimating lens for focusing said second group of parallel beams into a second output

optical fiber; and a second phase delay difference generating means for generating a second phase-delay difference between portions of said second group of parallel beams for generating an interference in said third collimating lens for selectively enhance signal transmission of a second set of wavelengths outputting from said second optical fiber.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims are rejected under 35 U.S.C. 103(a) as being unpatentable over (US 5975697).

Regarding claims 1 and 6-8, Podoleanu teaches an optical interleaver (shown at least in fig. 17; also see also col. 10, lines 40-47) comprising: a first collimating lens 17 for collimating an input optical signal into collimated beams (see col. 17, item collimated beams output from the lens 75) and a second collimating lens 136 for focusing said collimated parallel beams into an output optical fiber (see fig. 17, item lens 136 focussing collimated beams into fiber 41); and a phase delay difference generating means 132 for generating a phase-delay difference between portions of said collimated parallel beams for generating an interference in said second collimating lens 136 for selectively enhance signal transmission of certain wavelengths (see col. 18, lines 1-12;

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wherein the beams consist of wavelengths discusses at least in col. 10, lines 1-5 in which the signals/wavelengths using the interference means 132 the output beam/wavelengths used for imaging are enhanced see col. 7, lines 22-29). Podoleanu further teaches a set of cascaded interferometer, with phase delay plate 132/124 and a pair of collimating lenses 75/136, for generating a series of band-pass signal transmissions (shown at least in fig. 15-18, wherein the signals are generated are band-pass signal transmission see col. 7, lines 57-67) and a pair of lenses. However, podoleanu does not specifically state that the above interferometer is of mach-zender interferometer and the lens is of half-pitch GRIN lens. It is well known to those of ordinary skill in the art that the interferometers made of fibers that are coupled at the first end and the second end as shown at least in fig. 15-18 are known as mach-zender interferometer, and also it is obvious to a person of ordinary skill in the art when the invention was made to replace Podoleanu's lens 75/136 with that of half-pitch GRIN lens in order to produce an optical system that includes that above limitations, since such interferometer system would provide high resolution output signals that can be used in variety of applications such as high resolution imaging (see col. 7, lines 22-29).

Regarding claim 2, Podoleanu further teaches wherein: said phase delay difference generating means comprising a glass plate blocking a portion of said collimated parallel beams for generating a phase delay for a portion of said collimated parallel beams passing therethrough (see fig. 17, item 32; also col. 17, line 64-col. 18, line 8).

Regarding claim 3, Podoleaun further teaches said phase delay difference generating means comprising a glass plate having an upper portion covering an upper portion of said collimated parallel beams and said glass plate having a lower portion covering a lower portion of said collimated parallel beams for generating a phase delay difference between said upper portion and lower portion of said collimated parallel beams (shown in fig. 16-17, item 122/132; wherein the phase delay generating means glass plate 124/132, of element optical path difference (OPD) 112 shown in fig. 15-17, covers upper/lower portion of the parallel beams discussed in col. 17, line 40-12)

Regarding claim 4, Podoleaun further teaches a control means for controlling said phase delay difference generating means for selectively generating signal transmission at different wavelengths according to said interference generated in said second collimating lens (see col. 10, lines 55-58 and col. 6, lines 1-6; wherein the interference as seen in fig. 17, is generated at lens 136 using interference generator 132).

Regarding claim 5, Podoleaun further teaches said phase delay difference generating means 132 comprising a glass plate having a plurality predefined segments with different combination of plate-thickness and diffraction index wherein said phase delay difference generating means (see col. 18, lines 17-30) is controlled by said control means for selectively generating signal transmission at different wavelengths with a

predefined program (see col. 10, lines 55-58 and col. 6, lines 1-6; wherein the interference as seen in fig. 17, is generated at lens 136 using interference generator 132).

Regarding claim 11, 13 and 15 Podoleaun teaches an optical interleaver (shown at least in fig. 17; also see also col. 10, lines 40-47) comprising: a phase difference generating means 132 for generating a phase difference between different portion of optical beams (shown in fig. 17, item 132) for selectively enhancing signal transmissions at certain wavelengths resulting from interference between said different portions of optical beams (see col. 18, lines 1-12; wherein the beams consist of wavelengths discusses at least in col. 10, lines 1-5 in which the signals/wavelengths using the inteference meas 132 the output beam/wavelengths, used for imaging, are enhances see col. 7, lines 22-29). Podoleaun further teaches wherein said phase difference generating means 132 further comprising an optical element for transmitting optical beams therethrough (see fig 17 item 132); said phase difference generating means further comprising said optical element for transmitting optical beams therethrough (see col. 18, lines 17-30). However, podoleanu does not specifically teach wherein the above different thickness plates have different diffraction indexes. It is well known to those of ordinary skill in the art that glass plates such as lenses with different thickness/sixes have different diffraction indexes, since such plates in the interferometer system would provide high resolution output signals that can be used in verity of applications such as high resolution imaging (see col. 7, lines 22-29).

Regarding claim 12, Podoleaun further teaches control means for controlling said phase difference generating means controlling a selection of certain wavelengths for enhanced signal transmission (see col. 10, lines 55-58 and col. 6, lines 1-6; wherein the interference as seen in fig. 17, is generated at lens 136 using interference generator 132).

Regarding claim 14, Podoleaun further teaches said phase difference generating means further comprising said optical element for transmitting optical beams therethrough with at least two portions of different thicknesses (see col. 18, lines 17-30).

Regarding claim 16, 18 and 20, Podoleaun teaches a method for configuring an optical interleaver (shown at least in fig. 17; also see also col. 10, lines 40-47) comprising: employing a phase difference generating means 132 for generating a phase difference between different portion of optical beams (shown in fig. 17, item 132) for selectively enhancing signal transmissions at certain wavelengths resulting from interference between said different portions of optical beams (see col. 18, lines 1-12; wherein the beams consist of wavelengths discusses at least in col. 10, lines 1-5 in which the signals/wavelengths using the inteference meas 132 the output beam/wavelengths, used for imaging, are enhances see col. 7, lines 22-29). Podoleaun further teaches wherein said phase difference generating means 132 further comprising an optical element for transmitting optical beams therethrough (see fig 17 item 132);

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said phase difference generating means further comprising said optical element for transmitting optical beams therethrough (see col. 18, lines 17-30). However, podoleanu does not specifically teach wherein the above different thickness plates have different diffraction indexes. It is well known to those of ordinary skill in the art that glass plates such as lenses with different thickness/sizes have different diffraction indexes, since such plates in the interferometer system would provide high resolution output signals that can be used in verity of applications such as high resolution imaging (see col. 7, lines 22-29).

Regarding claims 17 and 19, the arguments presented in rejection of claims 12 and 14, above, are analogous in rejection of claims 17 and 19.

Citation of Relevant Prior Art

6. Prior art made of record and not relied upon is considered pertinent to applicant's disclosure. In accordance with MPEP 707.05 the following references are pertinent in rejection of this application since they provide substantially the same information disclosure as this patent does. These references are:

Dorrschner et al. Teaches at least independent claims

Riza 5274381 Relevant to claims 1-20

Riza 5307073

Shiraishi et al. 5719704

O'Meara et al. 5113282

Cappiello et al. 6415073

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Paiam et al. 6339474

These references are cited herein to show the relevance of the apparatus/methods taught within this reference as prior art.

Contact Information

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaveh Cyrus Kianni whose telephone number is (703) 308-1216.

The examiner can normally be reached on Monday through Friday from 8:30 a.m. to 6:00 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font, can be reached at (703) 308-4881.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

(703) 308-7722, (for formal communications intended for entry)

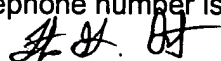
or:

(703) 308-7721, (for informal or draft communications, please label
"PROPOSED" or "DRAFT")

Hand delivered responses should be brought to Crystal Plaza 4, 2021 South
Clark Place, Arlington, VA., Fourth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956.

Kevin Cyrus Kianni
Patent Examiner
Group Art Unit 2877


Frank Font
Supervisory Patent Examiner
Group Art Unit 2877

September 12, 2002